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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,935	06/27/2003	Nicholas Grant Rasmussen	20567-023001	6976
20985	7590	08/03/2007		
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER GUILL, RUSSELL L	
			ART UNIT 2123	PAPER NUMBER
			MAIL DATE 08/03/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/608,935

Applicant(s)

RASMUSSEN ET AL.

Examiner

Russ Guill

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3 is/are allowed.
- 6) ☒ Claim(s) 4 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is in response to an Amendment filed July 13, 2007. Claims 1 - 4 have been examined. Claim 4 has been rejected. Claims 1 - 4 are allowable over the prior art of record.

### ***Response to Remarks***

2. Regarding claims 1 - 4 rejected under 35 USC 112:
- a. Applicant's arguments (page 4) and amendments to the claims overcome the rejections of claims 1 - 4. However, a new rejection caused by the amendment is made for claim 4.
3. Regarding claims 1 - 4 rejected under 35 USC 103:
- a. Applicant's arguments (pages 4 - 5) and amendments to the claims overcome the rejections.

### ***Claim Objections***

4. Claim 4 is objected to for the following minor informality: the claim recites in line 5, "movement information is associated with each 2D grid point." The claim is directed to an apparatus which is defined by its structure. The recited phrase appears to be a method step embedded in an apparatus claim with no associated apparatus. The Examiner suggests making the action be performed by the apparatus.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall

set forth the best mode contemplated by the inventor of carrying out his invention.

a. Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

i. Claim 4 recites, "a computing device". The specification discloses a computer in figure 7 and pages 19 - 20. However, a computing device is a broader term that encompasses elements such as hard-wired logic and Field Programmable Gate Arrays. This subject matter was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i. Regarding claim 4, the claim recites in the last line, "the simulated movement". The term appears to have insufficient antecedent basis. For the purpose of claim examination, the term is interpreted as, "the simulated advection".

*Allowable Subject Matter*

7. Claims 1 - 3 are allowable over the prior art of record.

8. Any indication of allowability of claim 4 is withheld pending resolution of the outstanding rejections.

9. Following is a statement of reasons for the indication allowable subject matter:

10. While Gamito ("Two-dimensional simulation of gaseous phenomena using vortex particles", 1995) teaches generating a 2D grid, each 2D grid having a plurality of grid points; associating movement information with each 2D grid point; changing the movement information associated with the 2D grid points over a time period that includes discrete intervals, displaying the simulated advection of the plurality of elements; and Stam (U.S. Patent Number 6,266,071) teaches generating a plurality of 2D grids, each 2D grid having a plurality of grid points, defining a region of 3D space using the 2D grids, and advecting a plurality of elements through the region of 3D space, neither Gamito nor Stam alone or in combination with the prior art of record teaches a method of simulating advection of a plurality of elements through space, specifically including:

- a. Regarding **claim 1**: "generating a plurality of 2D grids, each 2D grid being independent", "advecting the plurality of elements through the region of 3D space using the movement information associated with the 2D grids for rendering by a computing device",

in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant's invention defines over the prior art of record.

11. While Gamito ("Two-dimensional simulation of gaseous phenomena using vortex particles", 1995) teaches generating a 2D grid, each 2D grid having a plurality of grid

Art Unit: 2123

points, each grid point having movement information; displaying the advecting of the simulated elements, and Stam (U.S. Patent Number 6,266,071) teaches generating a plurality of 2D grids, defining a region of 3D space using the 2D grids, generating a plurality of elements in the region of 3D space, each element having a location; neither of these references taken either alone or in combination with the prior art of record teaches a method of simulating elements advecting through space, specifically including:

- a. Regarding **claim 2**: "generating a plurality of 2D grids, each 2D grid being independent", "for each element, determining movement information for an element based on the location of the element in the region of 3D space wherein the determination includes: identifying points on the 2D grids that lie on both sides of the element at the location in the region of 3D space; determining movement information at the points on the 2D grids; and interpolating between the movement information at the points on the 2D grids to determine element movement information for the element at the location in 3D space to simulate advecting of the element",

in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant's invention defines over the prior art of record.

**12. Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed

Art Unit: 2123

invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.


*Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday - Friday 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG

  
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8/2/07

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Examiner  
Art Unit 2123